

Hanford's Tank Corrosion Monitoring

Vanessa Anda
ARES Corporation

High-Level Waste Tank Integrity Workshop
May 2008



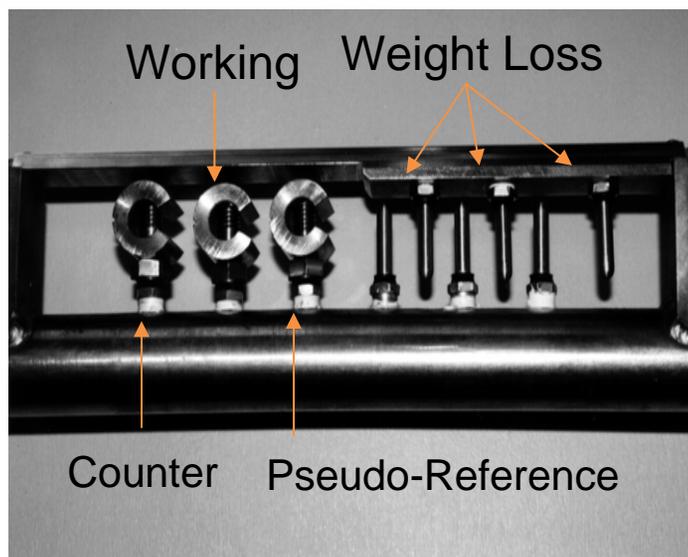
Overview

- Corrosion probe development history
- Probe design evolution through fifth generation
- Sixth generation probe
- Seventh generation probe
 - Design, fabrication, and installation
 - Data

Corrosion Probe Development

- Two year laboratory work 1995-1996
- Prototype field system in AZ-101, August 1996
- First-generation system in AN-107, September 1997
- Second-generation system in AN-102, August 1998
- Third-generation system in AN-105, January 2000
- Fourth-generation system in AN-104, January 2001
- Fifth-generation system in AN-107, August 2001
- Sixth-generation system in AN-107, September 2006
- Seventh-generation system in AN-102, May 2008

System Electrodes



First
Generation

Third through Fifth

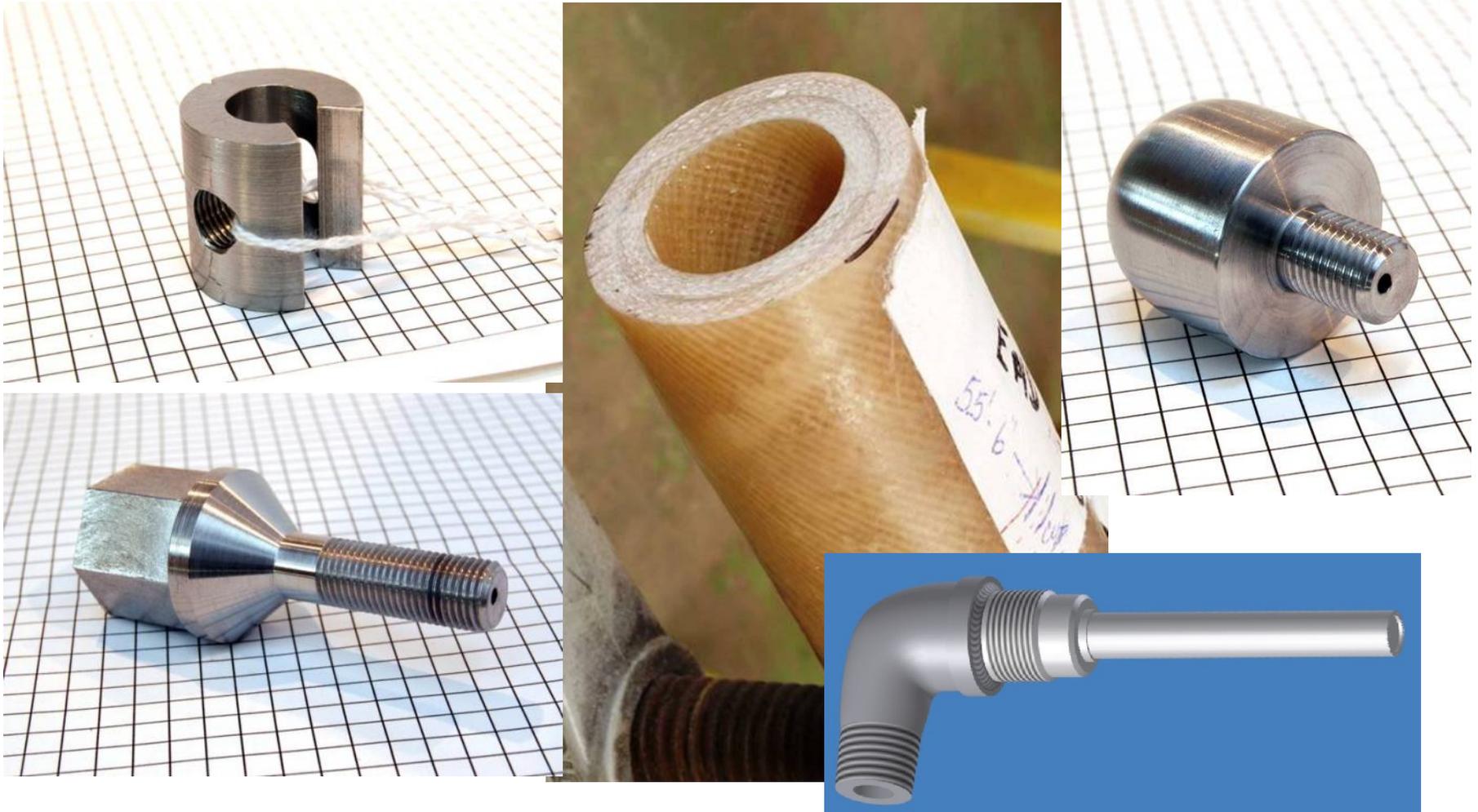


Second Generation

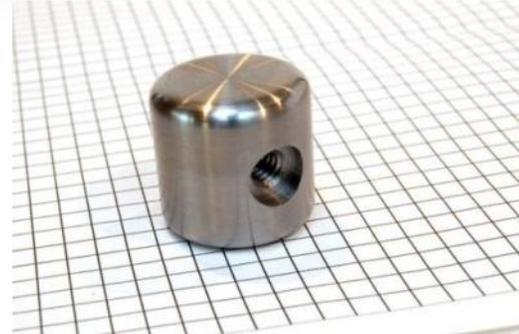
Sixth-Generation System: IMCP: Two Separate In-tank Probes

- Active Probe: Actively monitored, online, full-time.
- Specialized electrodes in vapor, supernate, and sludge regions.
 - EN, LPR, ER, Reference Electrodes
- Passive Probe: Vertical coupon rack.
 - 40 stressed and unstressed weight-loss coupons.
- Early detection (active probe).
- Cross-validation of active probe (passive probe).

Active Probe: Fiberglass Reinforced Plastic (FRP) Body



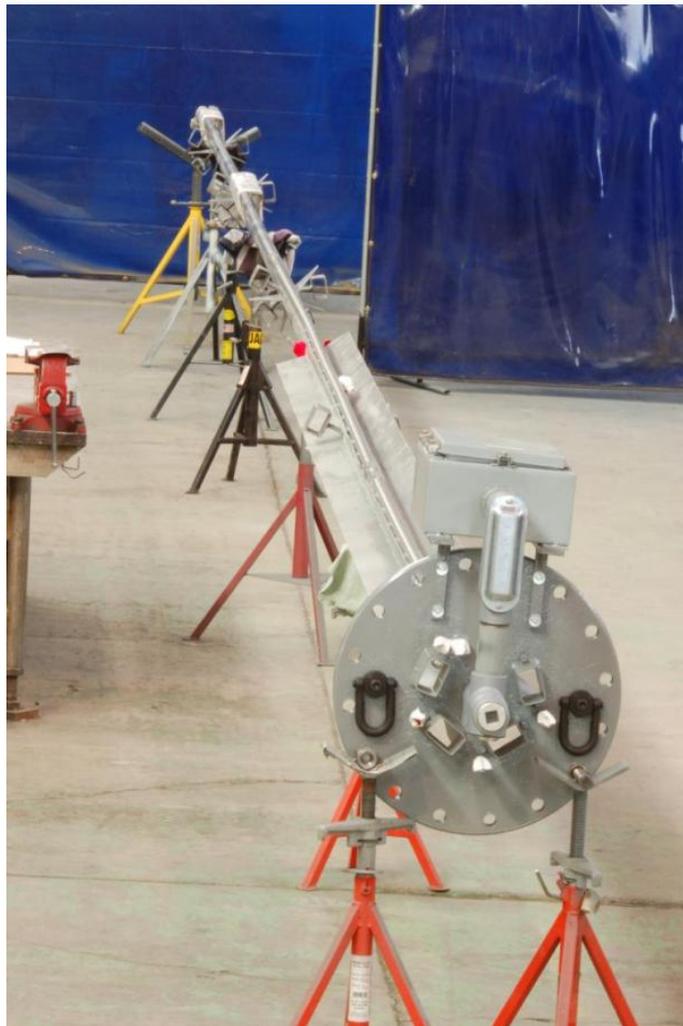
Passive Probe Coupons



Seventh-Generation AN-102

- 241-AN-102 Probe installed on 5/1/08.
- Returned to metallic probe body (carbon steel)
 - 3 ER probes (vapor, supernate, sludge)
 - 6 primary reference electrodes (Calomel, Ag/AgCl, and hybrid Ag/AgCl + CuSO₄)
 - Cu, Ni, Ag, A537 secondary electrodes + A537 coupons
 - 4 removable probes with coupons and C-rings
- Focus is on making corrosion potential measurements and comparing to ongoing lab work

Fabrication of AN-102 Probe



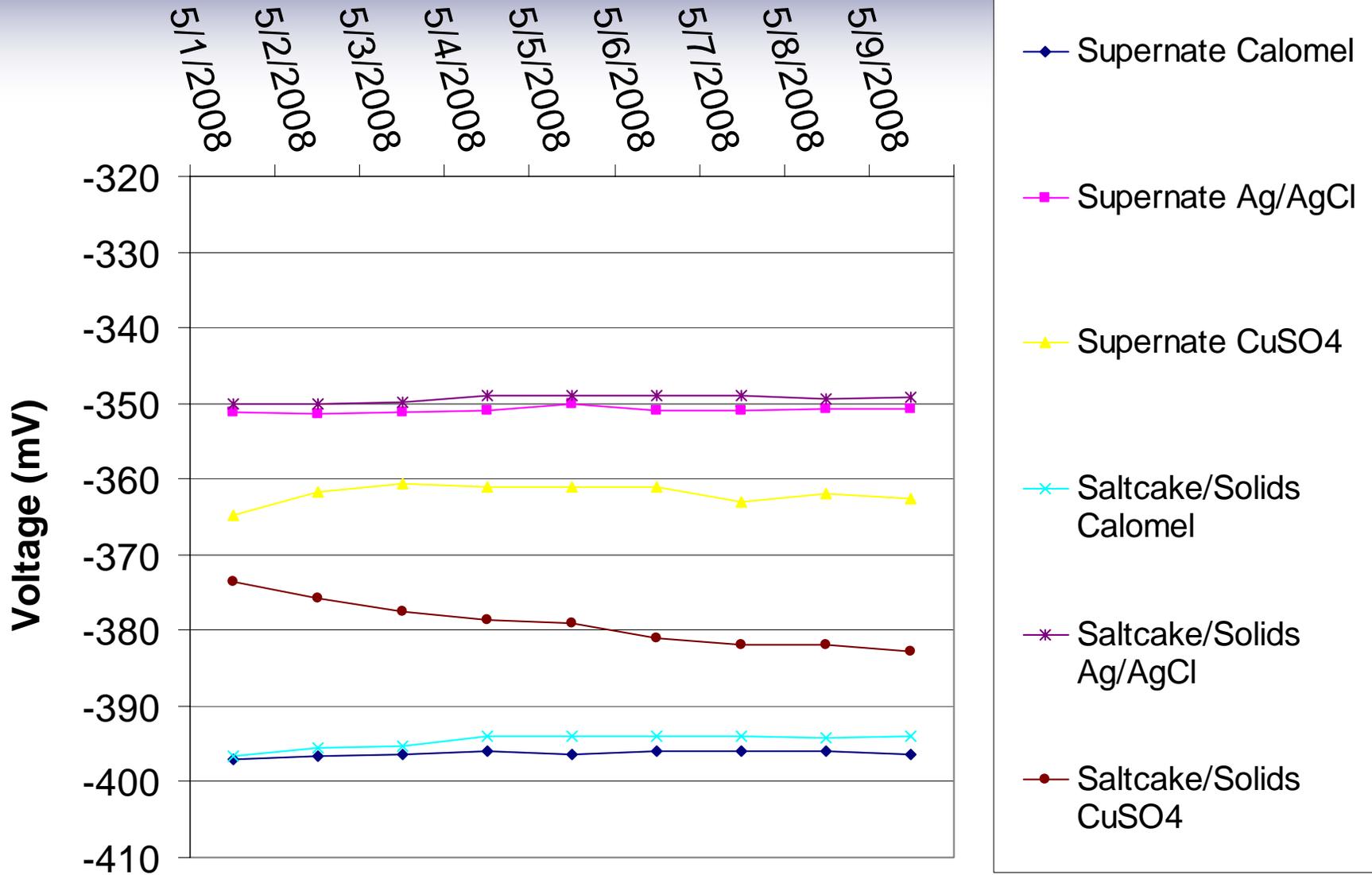
AN-102 Probe



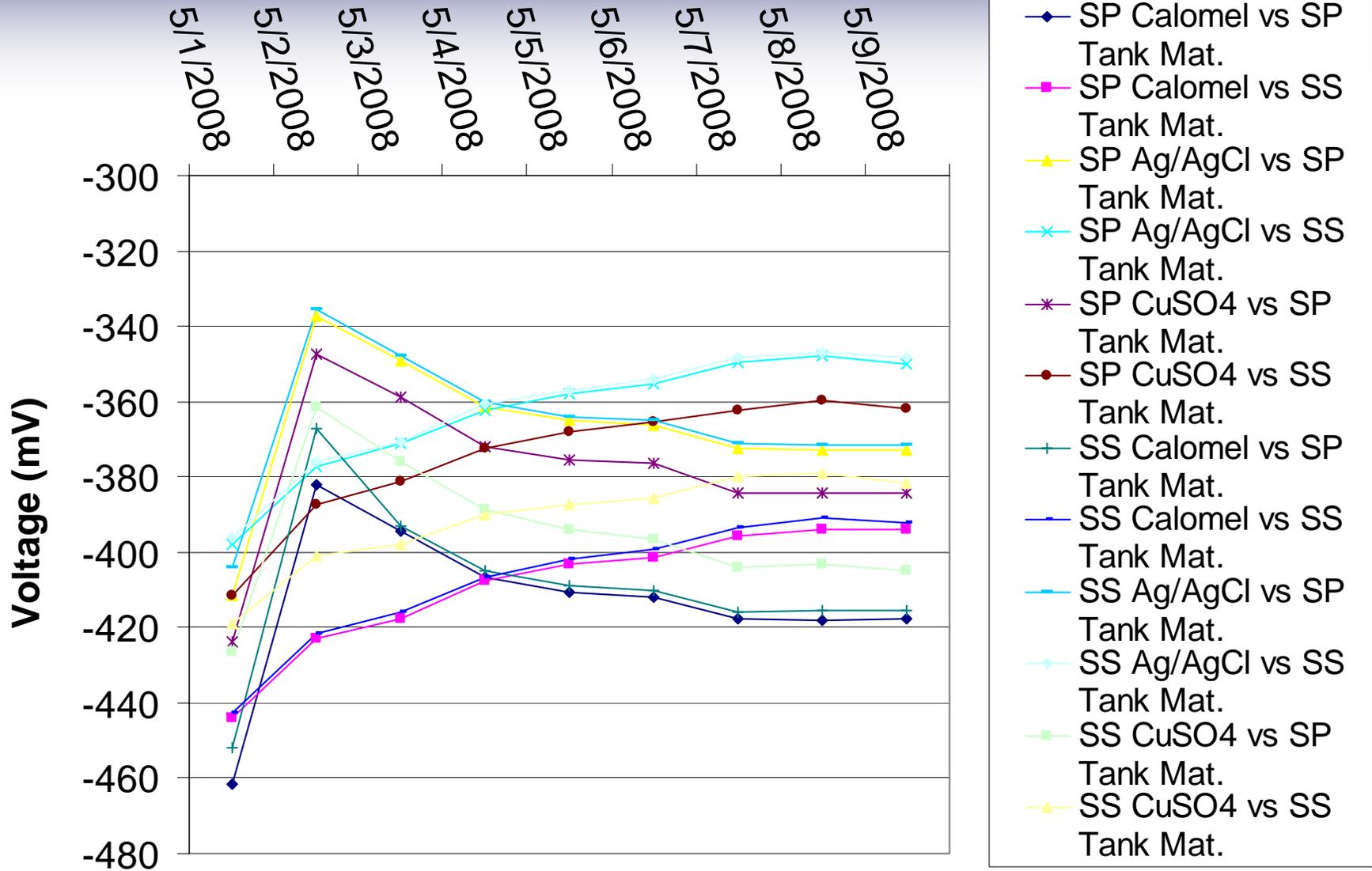
Installation of AN-102 Probe May 1, 2008



All Primary Electrodes vs Ground



All Primary Electrodes vs Tank Metal Averages



Supernate Calomel vs Secondary Electrodes

